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| 10/531,949 | 04/19/2005 | Masaru Minami | SON-2851 | 4516 |
| 23353 7590 05/07/2009 RADER FISHMAN & GRAUER PLLC LION BUILDING 1233 20TH STREET N.W., SUITE 501 WASHINGTON, DC 20036 | | | | |
| EXAMINER | | | | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/531,949

Applicant(s)

MINAMI, MASARU

Examiner

Karabi Guharay

Art Unit

2889

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on RCE, filed on 2/13/09.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-56 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-56 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/CDC)
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date: _____

Continued Examination under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 2/13/09 has been entered.

Response to Amendment

Amendment, filed on 1/27/09, has been considered and entered.

Claim Objections

Claims 1, 11 is objected to because of the following informalities: In 5th paragraph of claim 1 Applicant recites "a second top surface of the spacer is electrically connected to a second electrically conductive layer formed on the second panel through a second low-melting point metal material layer and a second electrically conductive material layer".

Applicant recites "a second electrically conductive material layer" twice, which is confusing because whether there are two second electrically conductive material layers or only one.

The corrected line should be "a second top surface of the spacer is electrically connected to the second panel through a second low-melting point metal material layer and a second electrically conductive material layer". Appropriate correction is required.

Similar corrections are required for claim 11 in step C, and for claim 29 in step D.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-5, 11-13, 15-22, 25, 29-38, 39-40, 43-44 and 48-56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ito et al. (US 6517399), and further in view of Niibori et al. (US 2004/0075378)

Regarding claims 1, 5, 11, 13, 15-16, 29, 33-34, 48-56, Ito et al. disclose a flat panel display (Fig 11) and a method of manufacturing the display, which is a cold cathode field emission display (lines 17-25 of column 1) comprising a first panel (1017) in which an anode electrode (metal back 1019) and second panel (1015) which is a cathode panel having plurality of cold cathode field emission devices (1012) which are bonded to each other in their in their circumferential portions and having a space between the first and second panel the space being in a vacuum state (Fig 7; lines 52 of column 13-17 of column 14 & line 6-19 of column 15), in which a spacer (20) is disposed between a first panel effective field and a second panel effective field that work as a

display portion; wherein the spacer is fixed to the first panel effective field and/or the second panel effective field with a first metal material layer (conductive adhesive 1041; lines 38-42 of column 18), wherein a first surface of the spacer is electrically connected to the first panel through a first electrically conductive material layer (25; lines 26-37 of column 18) and the first metal material layer (1041; a conductive adhesive), the first electrically conductive material layer (25) being between the first surface of the spacer and the first metal material layer (1041; see Fig 11), wherein a second surface of the spacer is electrically connected to the second panel through a second metal material layer (1041) and a second electrically conductive material layer (25), the second electrically conductive material layer (25) being between the second surface of the spacer and the second metal material layer (1041).

But Ito et al. fails to disclose that the first metal material layer is formed of a low melting point metal having melting point between 120 degrees centigrade to 400 degrees centigrade.

However, in the same field of flat panel display (image display apparatus), Niibori et al. teaches joining of spacers, with low melting point metal such as solder material which has melting point between 120 degree centigrade to 400 degree centigrade, also further teaches that such materials being low melting point metal reduces significantly amount of heat applied at the joining of the spacer, thus eliminating a strain in spacer assembly (paragraph 72).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use first metal material layer is formed of a low melting point metal such as solder, having melting point between 120 degree centigrade to 400 degree centigrade, as taught by Niibori et al., in the device of Ito et al. since such low melting point metal material will reduce

significant amount of heat applied at the joining of the spacer, thus eliminating a strain in spacer assembly.

Regarding claims 2, 12 & 30, Ito et al. disclose that the spacer is formed of ceramic or glass (lines 17-23 of column 16).

Regarding claims 3, 13, 25 & 31, Ito et al. disclose that the first panel and the second panel are bonded to each other in their circumferential portions through a bonding layer made of frit glass (lines 55-63 of column 13).

Regarding claims 17, 21-22, 35 & 39-40, combined method of Ito and Niirobi discloses the method for manufacturing a flat-type display according to claim 29 (see rejection of claims 11 & 29), in which a second low-melting-point metal material layer is formed on a portion where the spacer is to be fixed in the second panel effective field, and, the second low-melting-point metal material layer is melted when the first panel and the second panel are bonded in their circumferential portions in said step (C), and thereby the spacer is fixed to the second panel effective field (see Fig 11 where both sides of the spacer are connected to each panel through low melting metal materials; and lines 6-23 of column 28 of Ito et al.).

Regarding claims 18 & 36, Ito et al. disclose that the spacer is formed of ceramic or glass (lines 17-23 of column 16).

Regarding claims 19, 37 & 43, Ito et al. disclose that the first panel and the second panel are bonded to each other in their circumferential portions through a bonding layer made of frit glass (lines 55-63 of column 13).

Regarding claims 4, 20, 32, 38 & 44, the combined structure of Ito and Niitobi et al. discloses the flat-type display according to claims 1, 11 & 29, Ito teaches that the first panel and the second panel are bonded to each other in their circumferential portions by frit glass.

But Ito et al. fail to teach a low-melting-point metal material for bonding material. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use same low melting point metallic bonding layers in the peripheral portion of the anode plate (122) to bond first and second panel through the side wall 162, since such materials are suitable for use as bonding material.

Claims 6-10, 23-24, 26-28, 41-42, 44-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ito et al. (US 6517399), and Niitobi et al. (US 2004/0075378), as applied to claims 1, 11 & 29 above, and further in view of Hsiao et al. (2002/0096992).

Regarding claims 6, 10, 23, 27-28, 41 & 45-46, Ito et al. & Niitobi et al. teach all the limitations of claim 6, 10, 23, 27-28, 41, 45-46, (see rejection of claims 1, 11 & 29) except for a plurality of spacer holders for temporarily holding the spacer in the first panel.

However, Hsiao et al. in the same field of Field emission device, teaches forming spacer holder (16 of Fig 5D) on the first panel (anode panel 1) where the spacers are hold temporarily before anodic bonding (paragraphs 21 & 34). Hsiao et al. further teach that such holder supports the spacer in the upper plate so as not to drop off before anodic bonding, further reduces the thickness of FED and does not increase any extra process before fixing the spacer by anodic bonding (see paragraphs 18-21).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate holder in the device of Anderson, as taught by Hsiao et al.

since such holder will reduce extra process for manufacturing FED and reduces the thickness of FED.

Regarding claims 7, 24, 42, Ito et al. discloses that the spacer is formed of ceramic or glass (lines 17-23 of column 16).

Regarding claim 8, Ito et al. disclose that the first panel and the second panel are bonded to each other in their circumferential portions through a bonding layer made of frit glass (lines 55-63 of column 13).

Regarding claims 9, 26, & 44, Anderson, Ando & Hsiao et al. discloses the flat panel display of claims 6, 23 & 41, together with the first panel and the second panels are bonded to each other in their circumferential portions (see bonding layer 162) but is silent about layer is bonded through a material being made of a low-melting-point metal material. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use same low melting point metallic bonding layers (132) in the peripheral portion of the anode plate (122) to bond first and second panel through the side wall 162, since this facilitates manufacturing process as well as provide uniform height.

Claim 47 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ito et al. & Niiribi et al. as applied to claim 1 above, further in view of Toyota et al. (US2003/0190772).

Regarding claim 47, Anderson & Ando et al. discloses all the limitations of claim 47, except for a partition wall formed on the substrate of the first panel between phosphor layers and a light absorbing layer formed between the substrate and the partition wall.

However, Toyota et al. in the same field of flat panel display, discloses partition wall formed on the substrate (30 of Fig 1) of the first panel (AP) between phosphor layers and a light

absorbing layer formed between the substrate and the partition wall (see paragraphs 248-250). Toyota et al. further teaches that such partition between one phosphor to another phosphor on the anode substrate prevents optical cross talk and light absorbing layer between phosphor and between partition and the substrate provides improvement in the contrast of a display image.

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate partition between different color phosphor in order to avoid color mixing and providing a light absorbing layer between the substrate and the partition so as to increase the contrast of the display.

Response to Arguments

Applicant's arguments with respect to claims have been considered but are moot in view of the new ground(s) of rejection.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karabi Guharay whose telephone number is 571-272-2452. The examiner can normally be reached on Monday-Friday 9:00 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minh-Toan Ton can be reached on 571-272-2303. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Karabi Guharay/
Primary Examiner, Art Unit 2889

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